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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
WILLIAMS, LAWRENCE B	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/965,242	RAGHAVAN ET AL.	
	Examiner	Art Unit	
	Lawrence B. Williams	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7, 38, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745) in view of Wang (US Patent 5,822,368).

(1) With regard to claim 7, Chan discloses a transmission system (Fig. 1) comprising a plurality of receivers, each of the plurality of receivers receiving signals from one of a plurality of transmission bands (col. 28, lines 30-34) on a single electrically conductive transmission medium (Fig. 1, elements 2, 3). Chan does not explicitly the configuration of the receiver. However, Wang discloses a receiver's configuration of having a down-converter (Fig. 5, element 510), a filter (Fig. 5, element 590), an A/D converter (Fig. 5, element 515), an equalizer (Fig. 5, element 570), and a decoder (Fig. 3, elements 310, 315).

Therefore, it would have been obvious to one of ordinary skill in the art at the time to provide such receiver of Wang to the transmission system of Chan to provide a more reliable transmission system wherein error rate is reduced.

(2) With regard to claim 38, claim 38 discloses the method of the transmission signal disclosed in claim 1. Therefore a similar rejection applies.

(3) With regard to claim 44, claim 44 inherits all limitations of claim 38. Furthermore Wang also discloses adaptively choosing at least one operating parameter (Fig. 14). Wang teaches the updating of the equalizer dependent upon an initial channel response.

3. Claims 8-9, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745) in view of Wang (US Patent 5,822,368) and further in view of Baker (US Patent 6,163,563).

(1) With regard to claim 8, claim 8 inherits all limitations of claim 7. The modified transmission system of Chan does not explicitly disclose the in-phase signal being an input signal multiplied by a cosine function and the quadrature signal being an input signal multiplied by a sine function. However, such claimed limitation is well known in the as taught by Baker (col.4, line 58 - col. 5, line 11).

It would have been obvious to one of ordinary skill in the art at the time to provide such method of Baker to the modified transmission system of Chan to utilize such usefulness of a communication system in equipment employing integrated circuits and provide such advantage of reducing circuitry complexity.

(2) With regard to claim 9, claim 9 inherits all limitations of claim 8. Furthermore, Baker discloses in Fig. 1 an in-phase filter (element 42) and a quadrature filter (element 44).

It would have been obvious to one of ordinary skill in the art at the time to provide such method of Baker to the modified transmission system of Chan to utilize such usefulness of a communication system in equipment employing integrated circuits and provide such advantage of reducing circuitry complexity.

(3) With regard to claim 15, claim 15 inherits all limitations of claim 8. As noted above, Chan in combination with Wang and Baker disclose all limitations of claim 8. Furthermore, Baker also discloses in Fig. 1, wherein the analog-to-digital converter includes a first analog-to-digital converter (element 46) coupled to received signals from the in-phase filter and a second analog-to-digital converter (element 48) coupled to receive signals from the quadrature filter.

It would have been obvious to one of ordinary skill in the art at the time to provide such method of Baker to the modified transmission system of Chan to utilize such usefulness of a communication system in equipment employing integrated circuits and provide such advantage of reducing circuitry complexity.

(4) With regard to claims 16-17, Chan also discloses a phase correction circuit coupled between the analog-to-digital converter and the equalizer (Fig. 2, element 58).

4. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745 B1) in view of Wang (US Patent 5,822,368) as applied to claim 9 above, and further in view of Aono et al. (US Patent 5,844,950).

(1) With regard to claim 11, claim 11 inherits all limitations of claim 8 above. As noted above, Chan in combination with Wang disclose all limitations of claim 8. They do not however explicitly disclose the system further including an amplifier coupled between the filter and the analog-to-digital converter, the amplifier amplifying an in-phase filtered signal from the in-phase filter and a quadrature filter signal from the quadrature filter such that the analog-to-digital converter is filled.

However, Aono et al. discloses in Fig. 12, a cross polarization interference canceller wherein he teaches a system including an amplifier coupled between the filter and the analog-to-digital converter (106_1, 106_2) the amplifier (105_1, 105_2) amplifying an in-phase filtered signal from the in-phase filter and a quadrature filter signal from the quadrature filter such that the analog-to-digital converter is filled (col. 9, line 64- col. 10, line 12).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Aono et al. to increase accuracy of the A/D converter.

(2) With regard to claim 12, Aono et al. also discloses in Fig. 12, wherein an in-phase gain (105_1) of the amplifier and the quadrature gain of the amplifier (105_2) are adaptively chosen in an automatic gain controller.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Aono et al. to increase accuracy of the A/D converter.

(3) With regard to claim 13, Aono et al. also discloses in Fig. 12, wherein the automatic gain controller sets the in-phase gain and the quadrature gain based on the digitized signals from the analog to digital converters (col. 9, line 64 - col. 10, line 12).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Aono et al. to increase accuracy of the A/D converter.

(4) With regard to claim 14, though, Aono et al. does not explicitly teach wherein the in-phase and the quadrature gain are equal, it would be inherent that the gains could be equal if the feedback system determines that the dc offsets of both the in-phase and quadrature signals are equal.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Aono et al. to increase accuracy of the A/D converter.

4. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745 B1) in view of Wang (US Patent 5,822,368) as applied to claim 8 above, and further in view of LeFever (US Patent 4,599,732).

As noted above, Chan in combination with Wang disclose all limitations of claim 8 above. They do not however disclose wherein a phase rotator circuit is coupled between the analog-to-digital converter and the equalizer.

However, LeFever discloses in Fig. 2, a technique for acquiring timing and frequency synchronization in which he teaches a receiver wherein a phase rotator circuit (38) is coupled between an analog-to-digital converter (31) and an equalizer (34).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of LeFever with the invention of Wingo in combination with Sandberg et al. to perform instantaneous phase corrections (col. 5, lines 12-28).

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745 B1) in combination with Wang (US Patent 5,822,368) in view of LeFever (US Patent 4,599,732) as applied to claim 23, and further in view of Leyonhjelm et al. (US Patent 6,351,677 B1).

As noted above, the combination of Chan, Wang and LeFever disclose all limitations of

claim 23 above. They do not however disclose wherein a parameter of the phase rotator circuit is adaptively chosen. However, Leyonhjelm et al. discloses a wherein a parameter of a phase rotator circuit is adaptively chosen (col. 9, lines 23-35).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings Leyonhjelm et al. as a method of phase aligning the in phase and quadrature signals.

6. Claims 25, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745 B1) in view of Wang (US Patent 5,822,368) as applied to claim 8 above, and further in view of Sasaki (US Patent 6,121,828).

(1) With regard to claim 25, claim 25 inherits all limitations of claim 8 above. As noted above, Chan in combination with Wang disclose all limitations of claim 8. They do not however disclose wherein an amplifier is coupled between the equalizer and the decoder.

However, Sasaki discloses in Fig. 3, a demodulator wherein he teaches an amplifier (81, 82) coupled after an equalizer (70; the decoder though not shown would be inherent for the demodulator).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Sasaki as a method of maintaining an average power output of the signals.

(2) With regard to claim 28, Sasaki also discloses wherein an in-phase gain and a quadrature gain of the amplifier are adaptively chosen from error signals calculated from sliced values (col. 4, line 60- col. 5, line 4).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Sasaki as a method of maintaining an average power output of the signals.

(3) With regard to claim 29, Sasaki also discloses wherein the sliced values are determined from input signals (Fig. 3, output signals 6, 7) to the decoder (Again, though not disclosed, the decoder is inherent in the system).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Sasaki as a method of maintaining an average power output of the signals.

5. Claims 32-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745 B1) in view of Wang (US Patent 5,822,368) and further in view of Perlow (US Patent 6,351,293 B1).

(1) With regard to claim 32, claim 32 inherits all limitations of claim 7, above. As noted above, Wingo in combination with Sandberg et al. disclose all limitations of claim 7, above. They do not however disclose wherein the equalizer is a complex equalizer executing a transfer function, the transfer function having parameters $C_k^x(j)$ and $C_k^y(j)$ where j is an integer.

However, Perlow discloses in Fig. 2, a decision directed phase detector wherein he teaches a complex equalizer executing a transfer function. Though Perlow is silent as to the parameters of the transfer function, it is well known in the art that there would be various parameters in the implementation of the equalizer (transfer function, taps, weights, coefficients, etc.) and it would be a mere design choice to designate coefficients for these parameters, as applicant has claimed no distinct use for the claimed parameters.

(2) With regard to claims 33-37, the claims constitute a mere design choice of parameter quantities, as applicant has claimed no distinct use for the claimed parameters. Therefore the parameters would not constitute a patentable inventive step.

6. Claim 39, 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745 B1) in view of Wang (US Patent 5,822,368) and further in view of Sandberg et al. (US 5,715,280).

(1) With regard to claim 39, claim 39 inherits all limitations of claim 38. As noted, Chan in combination with Wang disclose all limitations of claim 38. They do not explicitly teach wherein the down-converting the input signal (X(t)) includes: multiplying the input signal by a cosine function at the frequency of the one of the plurality of transmission bands to obtain an in-phase signal; and multiplying the input signal by a sine function at the frequency of the one of the plurality of transmission bands to obtain a quadrature signal, wherein the base band signal includes the in-phase signal and the quadrature signal.

However, Sandberg et al. teaches teach discloses in Fig. 2, wherein the down-converting the input signal (X(t)) includes: multiplying the input signal by a cosine function at the frequency of the one of the plurality of transmission bands to obtain an in-phase signal; and multiplying the input signal by a sine function at the frequency of the one of the plurality of transmission bands to obtain a quadrature signal, wherein the base band signal includes the in-phase signal and the quadrature signal (col. 2, lines 20-26).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Sandberg et al. as a method of allowing each user in a multi-carrier transmission

system to decode only the portion of the data stream intended for that particular user (col. 1. line 63 - col. 2, line 3).

(2) With regard to claim 41, Wang et al. also discloses in Fig. 5, adjusting the phase (element 580) between the in-phase signal and the quadrature signal of the baseband signal.

(3) With regard to claim 42, Wang et al. discloses both an in-phase and quadrature correction (element 580-2).

(4) With regard to claim 43, Wang also discloses in Fig. 5, the method of claim 39 including slicing (element, 540) recovered data.

7. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wingo (US Patent 6,128,114) in view of Sandberg et al. (US Patent 5,715,280) as applied to claim 38 above, and further in view of LeFever (US Patent 4,599,732).

Claim 44 inherits all limitations of claim 38 above. As noted above, Wingo in combination with Sandberg et al. disclose all limitations of claim 38. They do not however disclose the method including adaptively choosing at least one parameter.

However, LeFever teaches in Fig. 2, a technique for acquiring timing and frequency synchronization in a receiver wherein he discloses adaptively choosing at least one parameter (col. 5, lines 35-41).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of LeFever with the invention of Wingo in combination with Sandberg et al. to maintain accurate symbol correction during changing conditions of the received signal.

7. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (US Patent 6,259,745) in view of Wang (US Patent 5,822,368).

(1) With regard to claim 45, Chan discloses a receiver system comprising means for receiving an input signal from a single conductive transmission medium, the input signal including a plurality of transmission bands (col. 28, lines 30-34, Fig. 1, elements 2, 3). Chan does not explicitly the configuration of the receiver system. However, Wang discloses a receiver's configuration of having means for a down-converter (Fig. 5, element 510) the input signal to receive a base-band signal, means (Fig. 5, element 515) for obtaining a digital signal from the base-band signal; means for equalizing (Fig. 5, element 570) the digital signal, and means (Fig. 3, elements 310, 315) for decoding the digital signal to recover data transmitted by a corresponding transmitter.

Therefore, it would have been obvious to one of ordinary skill in the art at the time to provide such receiver of Wang to the transmission system of Chan to provide a more reliable transmission system wherein error rate is reduced.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-41 of Co-pending Application 10/071,771 contain every element of claims 1-45 of the instant application and as such anticipate claims 1-45 of the instant application.

"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or **anticipated by**, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus). " ELI LILLY AND COMPANY v BARR LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghayour Mohammad can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
July 18, 2006

EMMANUEL BAYARD
SUPV EXAMINER